

### **REMARKS/ARGUMENTS**

This amendment is responsive to the Official Action of September 16, 2004, a final rejection. Claims 1 – 11, 13 and 14 will be active in this application subsequent to entry of this amendment.

#### **Claim Amendments**

The amendments to the claims are directed towards highlighting the dual functionality of the compounds of formula I, in particular, claim 1 to reflect the dual role having regard to the components present in the single layer (ie electron & hole transporters, etc.).

Claim 1 is amended for purposes of clarity to specify the compound of formula I is present in the single organic layer and acts as an electron transporter and light emitter. Basis for this amendment can be found in the 3<sup>rd</sup> paragraph of page 8 of the specification. New claim 13, which uses the wording in amended claim 1, but is limited to only the first ligand.

Also included new claim 14, which re-casts the scope of the main claim in terms of the functions present in the single layer (rather than the components present). Claim 14 has literal basis in the description on original page 6 which states: "By stating that the organic layer is a single layer it is meant that the electron transport, hole transport and light emitting functions are provided by a single layer.". Also, the phrase "present as electron transporters and light emitters" is disclosed in connection with the Formula I compounds on original page 8 of the PCT text, and hence, has appropriate basis.

The comments below respond to the correspondingly numbered Items of the Office Action:

#### **Item 2**

Claims 9 and 10 are amended to use the identifier "Previously Presented" as the examiner requests; claims 1 and 5 are correctly presented to reflect the understandings stated in the second paragraph of this item.

#### **Item 3**

Applicants note that rejections a) to c), as identified in Item 3, have now been overcome.

Item 4

Claim 12 has been deleted in order to reduce issues and advance prosecution.

Item 5

The Examiner has maintained the position that claims 1-4, 6, and 9-11 are obvious in light of US 5,281,489 (Mori), when taken in combination with either US 5,189,029 (Boyer), DD 265266 Czerney or Applied Fluorescence Technology, June 1989, pp13-14 Czerney (both referred to as Czerney). Applicants disagree.

Applicants also maintain their respective position of non-obviousness, as outlined in the Amendment and response of June 15, 2004, and respectfully submits that the current obviousness objection is impermissibly based upon hindsight. Claim 1 has, however, been amended, and an alternative independent claim 14 added, in order better to characterize the present invention. Claim 13 is added directed to a preferred aspect of the disclosure.

The invention that the Applicants have made is the selection of specific, narrowly defined compounds that allow improvements when used as light emitters in single layer LED devices. Such compounds inevitably act not only as a light emitter, but also possess the function of transporting electrons. The advantages of a light emitter which can transport electrons is that there is a general increase in the efficiency of the device, which can give rise to a decrease in the required driving voltage of the LED and/or an increase in the light output. Applicants have amended claim 1 to emphasize this aspect of dual functionality. Thus, claim 1 now reads:- "... compound of formula 1 is present in the single organic layer and acts as an electron transporter and light emitter". Basis for that amendment can be found in the 3<sup>rd</sup> paragraph of page 8 of the PCT application.

New claim 14 has been similarly restricted to require the compound to perform both functions. However, claim 14 provides an alternative definition of the invention where the electron transport, hole transport and light emitting functions are provided by a single layer, which amendment has literal basis on page 6 of the specification as explained above.

While there are numerous laser dyes, only a few will provide both a light emitting and electron transport function. The identification of such compounds would not be straight forward and there may be other reasons why such compounds would not in any case be suitable for use in a single layer device. Certainly, the teachings of Czerney or Boyer are merely disclosures of light

emitters and provide no direction or teaching as to their suitability in single layer devices according to Mori, or any indication if they would provide an electron transport function. Accordingly, none of the cited documents disclose or suggest the requirement in the claims for a light emitting boron compound having dual functionality as an electron transporter.

On the basis of the present record the Examiner has not established motivation in the art to combine the references in the manner in which they are aggregated in the present rejection. It is well-established that before a conclusion of obviousness may be made based on a combination of references, there must have been a reason, suggestion, or motivation to lead one of ordinary skill in the art to combine those references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617-18 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.")

In other words, the test is not *could* one skilled in the art combine references, the proper test is a considerably higher standard – *would* one skilled in the art combine the references. The Official Action does not satisfy this higher, precedent-mandated standard. Instead, the Examiner has relied upon showing one patent (Mori et al), which discloses single layer organic LED devices which use laser dyes as the emitter...then combined (Mori) with 3 separate patents which show laser dyes according to applicants' invention. The patent by Mori discloses an extremely long list, at least 2 columns, of laser dyes. Surely such an extensive list must clearly direct the skilled person away from considering materials not on the list?

The Examiner is in effect arguing that it would be obvious to try (without any expectation of success) the compounds of Czerney or Boyer in the devices of Mori. Applicants reiterate that the Examiner has failed to make an adequate case as to why the skilled addressee would (as opposed to could) have selected the particular boron compounds of the present invention from the numerous documents in the prior art pertaining to laser dyes. Applicants could cite hundreds of papers or patent documents relating to laser dyes: the Examiner has failed to identify any flags or pointers in Boyer or Czerney that would have assisted the skilled addressee in consulting and following the teachings of those particular documents **as opposed to the numerous other laser dye documents in the art.**

Thus, the mere fact that references can be combined or modified (and Applicants believe they cannot be) does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); MPEP § 2143.01. Hence, the Examiner's attempt to combine the cited references alone without any suggestion in the references themselves of the desirability of the modification is improper and should be withdrawn.

Applicants believe that the amendments made to claims 1, 13 and 14, which require that the present boron compounds act as light emitter and electron transporter, clearly differentiate Applicants' invention from the combined disclosures of the cited combination of documents, and hence, that those claims relate to patentable subject matter. Reconsideration of this rejection is requested.

Item 6

Regarding the Examiner's objections to claims 5, 7 and 8, those claims are allowable at least by virtue of their dependence upon claim 1.

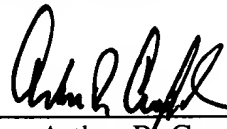
Item 7

Applicants believe that the amendments made to the claims obviate the need for comparative data. Nevertheless claim 13, directed to particular compounds for which comparative data has been supplied, has also been introduced into the claims for the Examiner's consideration. For the above reasons it is respectfully submitted claims 1-11, 13 and 14 define patentable subject matter and are in condition for allowance. Reconsideration and favorable action are solicited.

Respectfully submitted,

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